products usually resulting from changes occurring in the seat of circumscribed softenings or old effusions, nor were there evidences of echinococci, cysticerci, or other adventitious products which are known to occur in the brain in cystic form, and the existence of which would almost certainly insure a fatal termination.

ON RECENT PROGRESS IN HOSPITAL PLANNING AND ARRANGEMENTS.

By Keith Downes Young, F.R.I.B.A.,
ARCHITECT TO THE LONDON FEVER AND MIDDLESEX HOSPITALS.

It has been well remarked by Dr. Mouat that hospitals in this country have not, as regards their construction and management in relation to the treatment of disease, kept pace with the advance of civilization in other branches of social economy. While, on the one hand, medical and surgical science are constantly and steadily advancing in the path of progress, it must be admitted that, with one or two exceptions, the science which concerns itself with the construction and arrangements of the buildings in which the treatment of the sick has to be done, is very much in the state in which it was twenty years ago. We hear of the same hospital diseases which were supposed to be inherent in the older forms of construction, taking root and flourishing in the newest and most costly buildings; and we look in vain amongst the larger hospitals for any indication of that careful thought for structural improvements, both in general plan and in administrative details, which characterizes in so marked a fashion many of the newer hospitals in France, Germany, and Belgium.

Exceptions must, however, be made in favor of three classes of buildings: (α) Infirmaries attached to workhouses; (β) Hospitals for infectious diseases; and (γ) Cottage hospitals.

In the first two classes much and excellent progress has been made; and the credit for this progress is very largely due to the guiding and controlling influence of the responsible advisers of the Local Government Board.

Of the many large and admirable buildings for the treatment of the sick and infirm poor which have been erected during the last few years, perhaps the Marylebone Infirmary at Notting-hill, is one of the best and most complete examples. This building, which was opened in June, 1881, affords accommodation for 744 patients, in 36 wards of 2 beds each, and 24 wards of 28 beds each. The site is a rectangular piece of land somewhat limited in area, having a ratio of 82 square feet of site per bed, and the buildings are arranged in four parallel pairs of pavilions running north and south, with the administration block in the centre. The ward pavilions are three stories in height, and the space allotted to patients is as follows: Wall space 6 feet, floor space 72 feet, and cubic space 936 feet. The beds are arranged in pairs with a window between each pair, and the windows are in all cases opposite each other. The amount of space allowed in the wards of workhouse infirmaries was determined by a committee appointed by the Poor Law Board in 1867, and in their report, which forms the foundation for the regulations laid down by the Local Government Board (the successors of the Poor Law Board), they recommend that the minimum cubic space should be 850 feet per bed, and the wall space not less than 6 feet per bed; and in cases where the height of the ward is more than 12 feet, such additional height is not to be taken into consideration in estimating the cubic space per bed. In determining these amounts, the Committee had in view the fact that the cases treated in workhouse infirmaries are largely of a chronic and non-acute character, and that therefore the air space required would not be so large as in wards for the treatment of acute surgical or medical disease. A special feature of the St. Marylebone Infirmary, which does not exist in connection with any other workhouse infirmary, is the Nursing Home, for training women specially in the work of nursing in institutions of a similar nature. This is a step in the right direction, the wisdom of which it is scarcely possible to overestimate. To anyone who has seen the old pauper nurse at work, it will not be difficult to realize the difference between the old order and the new, and to appreciate the altered tone of a ward administered by a properly trained nurse.

The value of hospitals for infectious diseases as a means of isolating the sick from the healthy, and so of arresting the spread of disease, was recognized at a very early period in the history of these institutions. But the necessity for the provision of hospital accommodation seems to have been mainly, if not entirely, felt and acted upon in large and crowded towns where diseases like typhus and relapsing fever have been, under specially insanitary conditions, such as overcrowding and filth, almost endemic. It is only of late years that, owing to the persistent counsel of the Local Government Board, local sanitary authorities have been convinced of the extreme value of even the smallest hospital accommodation as a preventive rather than as a curative agent. In many cases the provision made is of a most temporary and perfunctory nature; and, as Dr. Thorne points out in his report (Supplement to the Tenth Annual Report of the Local Government Board, 1880–81) those hospitals which have been erected under the influence of panic rarely prove adequate for the needs of the district even in non-epidemic times; while the hospitals that are erected in order to prevent epidemics by providing ready means of isolation for first cases are, as a rule, excellent examples of the kind of provision that is required.

One of the best instances of this is the small isolation hospital built by the Bournemouth Sanitary Commissioners. This hospital comprises at present three detached buildings: the administrative building, in which are dwelling-rooms for the matron and nurses; the ward block; and a building containing mortuary, disinfecting-room, wash-house, and ambulance shed.

The ward block is a reproduction in principle of the small isolation block at the London Fever Hospital; it contains two wards for three beds each, and two wards for two beds each. The three bed wards are placed one at each end of the building, and between each three bed ward and the smaller wards is a nurses' room. The communication between the rooms is by way of an open corridor, off which are placed in projecting wings the water-closets and sinks. This corridor is divided transversely by a wall, which thus separates the building into two equal parts, each part containing two wards and a nurses' room and one of the two water-closet projections. The object of this arrangement is to provide for the treatment at one and the same time and under one roof of two entirely distinct diseases, as, for instance, scarlatina and small-pox. On the opposite side to the corridor is a wide veranda accessible to all the rooms, and which can, with proper administrative precautions, be used by all the patients. The site upon which these buildings stand is amply large enough to allow of the erection of two, or possibly three, more pavilions; but with the existing buildings as the permanent provision always available for the prompt isolation of the first case occurring in the district, it will probably be found, in the event of an epidemic breaking out, more convenient to provide for an increased number of patients by means of tents or huts; the former being disinfected and stowed away, and the latter burnt, at the end of the outbreak.

A remarkably interesting example of a hospital for infectious diseases is the Communal Hospital at Copenhagen, completed in 1883. The reasons put forth by the municipal authorities for the establishment of this hospital are so very pertinent, that no apology need be made for quoting them here: "En bâtissant l'hôpital des maladies épidémiques on ne voulait pas seulement un établissement où pouvaient être soignés les malades atteints de ces affectiones, mais on visait encore à un autre but. Possédant une institution où pouvaient être isolés immédiatement, non seulement les individus atteints d'une maladie contagieuse mais encore les cas suspects, on espérait pouvoir préserver autant que possible la ville des épidémies. Ainsi l'hôpital devait être une institution préventive." (*Descriptian sommaire de l'hôpital des maladies épedémiques de Copenhagen*, par S. T. Sarensen and F. J. Hermann, Copenhagen, 1884.)

The hospital comprises thirteen separate buildings, eight of which are ward blocks, the other five being used for administrative purposes. These buildings are all entirely detached, there being no covered communication whatever between one block and another.

In the front administrative block, which contains the offices and residences for staff, are two points of detail that are noticeable. One is the arrangement for visiting. The patient to be visited (visiting being restricted, so far as possible, to convalescents) enters the building by the door communicating with the garden, and awaits his visitor in a room close to the entrance. The visitor enters the building on the opposite side, and is taken to a room immediately adjoining that in which the patient is, but he traverses no part of the building through which the patient has been before him. Between the two rooms is a window protected by a "grille," and while the patient and his friend can see and converse with each other, they cannot come within touching distance.

The other detail is the arrangement of bath and dressing-rooms for the medical staff. This consists of a bath-room with a dressing-room on each side; when leaving the hospital after going round the wards, the physician enters one of the dressing-rooms, where he divests himself of his hospital clothing, passes into the bath-room, where he takes a bath; and so into the other dressing-room, where he finds his ordinary clothes.

Two of the pavilions are divided up into single bed wards; in one case these wards are for doubtful cases, or for cases needing special isolation; in the other they are for private patients, presumably paying for the extra accommodation.

All the buildings are provided with very complete means of ventilation and warming by the aid of "calorifères" and hot-air stoves on the system so much adopted in continental hospitals.

An instance of a really complete and well-considered hospital of a purely temporary nature is the Infectious Disease Hospital at Park Hill, Liverpool. The wards of this hospital consist of four pairs of hospital tents and two pairs of iron buildings. The buildings containing the nurses' rooms, bath-rooms, and day-rooms are formed of wooden framing, covered externally with Willesden paper and lined internally with boarding, the interspace being filled with silicated cotton.

A notable fact in connection with this hospital is that it was erected and completed ready for use in less than two months.

The two great "barrack" hospitals at Berlin (the "Moabit" and "Charité") are examples of a more or less temporary method of construction, though neither is used exclusively for fever or smallpox. The wards in both cases are constructed of wooden framework, the interstices being filled at the "Moabit" Hospital with stone, at the "Charitė" with bricks laid dry. The "Moabit" Hospital is warmed by means of steam-pipes from a central boiler-house, while the wards at the "Charité" are each warmed by two iron stoves faced with white Dutch tiles, provided with an arrangement of coils of iron pipes for increasing the radiating surface. In order to overcome the extreme dryness of the air warmed by this means a pan of water is introduced into the stove, in such a manner that the heat of the fire evaporates the water, and the resulting vapor mixes with and moistens the warmed air from the iron surfaces. The "Moabit" Hospital was originally designed, in 1872, purely as an epidemic hospital, but since the year 1875 it has been used for the treatment of diseases of every kind except mental affections. In the year 1880, for example, of a total of 2780 cases treated in the Hospital, 697 are classed as acute infectious diseases, 491 as surgical, and 774 as diseases of the organs of respiration.

The great advantage of temporary hospitals for the treatment of infectious fevers, is the ease and quickness with which additional accommodation can be provided on a sudden emergency; but the danger of fire in tents or huts is a matter that must be provided against in the most careful manner.

Coming now to the subject of general hospitals, under which term may be included the class of small hospitals known as "cottage hospitals," it will be interesting in connection with the question of temporary as opposed to permanent hospitals, to note the views of an eminent authority on the subject, Dr. Billings, U. S. A. After remarking ("Essay on Hospital Construction and Organization," New York, 1875) that the results given by many large and costly buildings were by no means commensurate with the labor, money, and ingenuity expended on them, that hospital diseases had made their appearance in many such buildings, and that attempts at purification and disinfection had not always been successful, Dr. Billings shows how the experience of the military surgeons during the American Civil War and all the recent wars in Europe led to the recommendation that wooden barracks and tents should be adopted for all hospitals. The reasons for this advice were not only that huts and tents are more readily disinfected and ventilated than permanent structures, but that, inasmuch as all the buildings are liable to become saturated, so to speak, after a certain time with the contagion of disease, it is easier and cheaper to abandon or to destroy a wooden hut than it could be to destroy a building of brick or stone.

These views Dr. Billings subsequently modified greatly, and his opinions may be summarized thus: For military hospitals and for infectious diseases, huts are probably better suited than permanent wards; but for general hospitals, where much subdivision of patients is necessary, and where economy of administration is an element to be regarded, permanent structures are preferable. The advocates of temporary wards maintained that their system was unfavorable to the development of hospitalism. This, Dr. Billings shows to be an error. "I have myself," he says, "emptied a barrack ward and placed the men in tents, on account of the appearance and persistence of septic disease. I have seen a decided tendency to erysipelas and pyæmia appear in a most characteristic barrack ward, an unplastered building, with excessive ridge ventilation, within six weeks after it was first occupied. The weather was warm, and for a week there was little wind, so that the process of natural ventilation was unsatisfactory." ("Essay on Hospital Construction," *op. cit.*, p. 17.) The chief reasons against the adoption of any system of temporary wards are the danger of fire and the great cost of administration consequent on the necessity for the buildings being all of one story only.

The most remarkable and, so far as England is concerned, perhaps the only development in general hospital building of recent years is the circular ward. Like all new inventions, the idea of adopting the circle for the purpose of a sick ward seems to have simultaneously occurred to more than one person. In 1876, when the question of rebuilding University College Hospital, London, was being seriously discussed, the distinguished surgeon to that hospital, Mr. John Marshall, F.R.S., devised a plan an essential part of which was that the wards were in the form of four circular towers. About the same time the foundations of a hospital were laid at Antwerp, the wards of which were arranged in eight circular towers; and at a period probably anterior to this, Sir Andrew Clarke, R.E., G.C.B., now Inspector General of Fortifications, prepared a plan for a hospital in Madras with circular wards.

The first circular wards to be actually occupied with patients were those of the Miller Memorial Hospital at Greenwich, a little building erected in memory of the late Canon Miller, founder of Hospital Sunday. Besides this there are in England three other examples of circular wards completed, viz.: Military Hospitals at Seaforth near Liverpool, and at Milton near Gravesend, and a workhouse infirmary at Hampstead. A general hospital is in course of erection at Burnley, which will have ultimately four ward pavilions of twenty beds each—and in New York, a Cancer Hospital with three circular towers is approaching completion.

The advantages of a circular ward are briefly these: 1st. It can be placed without difficulty in many positions in which it would be impossible to put a rectangular ward; 2d. In the placing of a circular ward upon a site, aspect can be wholly disregarded, except, of course, as regards the relation of the ward block to other buildings; 3d. A circular building can be so planned that the air can have free access to the enclosing walls along the whole length of the circumference—and in whatever direction the wind blows, it must blow at right angles to some point in the circumference; whereas it is conceivable that the wind when blowing in a parallel direction to the longer axis of a rectangular ward would be practically lost for purposes of ventilation; 4th. A circular ward is economical of wall; of two wards each for a given number of beds and each having precisely the same amount of floor and cubic space, the circular ward will be enclosed in walls of a considerably less linear measurement than the rectangular ward; 5th. Provided that the warming apparatus, whatever it be, is placed in the proper position—*i. e.*, in the centre of the ward—the diffusion of warmth will be far more equable in a circular ward than would be possible in a rectangular ward; 6th. In the matter of free access of light and air a circular ward possesses advantages superior to those of any other form. As Professor Marshall points out, a circular ward is obviously the inverse of the plan condemned so strongly by Oppert, when he says, "the worst wards are those where least air and light are provided," and "a closed court with wards around it is the worst arrangement." (*Hospitals, Infirmaries, and Dispensaries*, by F. Oppert, M.D)

Circular wards have scarcely been in existence long enough to warrant any positive statement being made as to their superior efficiency to wards of a rectangular form; but this much may be said as regards the work done by the Miller Memorial Hospital. In the first place, it has been amply demonstrated by these wards that the fears so strongly expressed that a circular ward would be ill-lighted and objectionable on account of the patients being presumably more visible to each other than in a rectangular ward, are entirely groundless. Then the fact, that during the eight months that the Hospital has been opened a constant succession of cases, chiefly surgical, and of a very severe nature, have been treated in the wards with uniform and marked success, is sufficient to show that the circular form, in this instance at least, is fully equal to the work required of it. Time alone will show whether this form of ward possesses the superiority which its advocates hope for it, in the more efficient aëration, or what may fitly be called its greater self-cleansing properties.

In order to endeavor to ascertain the special characteristics of a circular ward in the matter of ventilation, the Hospital Association has appointed a committee to conduct experiments, and endeavor to arrive at an estimate of the value of the circular form as compared with the rectangular. The task before the committee is by no means an easy one, but it is greatly to be hoped that their investigations will throw some light on a subject that has of late formed the battleground for a somewhat heated controversy.

Reference has been made to improvements in hospital construction abroad. Perhaps the most remarkable instance is the system devised by M. Tollet, and usually called by his name. The main feature of the system lies in the sectional form of the ward, which M. Tollet makes a pointed arch. It is essential to the system that the ward should be of one story only, as an important feature of this particular form is that the outlet for vitiated air is at the apex of the arch. M. Tollet contends that by the adoption of this form the free passage of air is not liable to be checked by any internal angles. His system of construction, moreover, being entirely of iron and stone, brick, or concrete, is not only fireproof, but is said to present on the inside impervious surfaces, which afford no harbor of any kind for disease germs. Of the many buildings erected on this principle, the Municipal Hospital at St. Denis is perhaps the most complete, and best exemplifies M. Tollet's views. This hospital accommodates 166 patients, including aged, chronic, and infirm men and women, medical and surgical cases of both sexes, lying-in women, infectious diseases of both sexes. The buildings are entirely detached, the wards for medical cases alone being arranged in pairs, with a connecting corridor. The ward blocks are raised about two feet above the ground level, and have underneath an open space about eight feet in height, the ground around the wards being sloped away at an angle of forty-five degrees.

A feature to be remarked in this, as in many other recently erected hospitals on the continent, is the large proportion of land to patients—the ratio at St. Denis being 1570 square feet of site per patient.

The special characteristic, apart from M. Tollet's peculiar form of construction, of the hospitals erected on this system, and the feature that has probably the most important bearing on the well-being of the patients, are the way in which the wards are isolated one from the other, and the perfect classification of diseases of which this arrangement admits. This complete atmospheric severance of the wards is a feature which has been also largely adopted in the most recent hospitals in Germany. The most complete example of this is the Academische Krankenhause at Heidelberg. There are in this hospital eleven separate ward pavilions, connected with each other and with the administrative block by a covered way with the sides entirely open; five of these pavilions being devoted to the reception of surgical cases, four to medical cases, one to skin diseases, and one to diseases of the eye.

Of all modern developments in hospital work, not the least interesting and important is that of the cottage hospital. The first cottage hospital opened in England was that at Cranleigh, in Surrey, which was founded by Mr. Albert Napper in the year 1859. By the year 1879 some two hundred hospitals had been started, and the probability is that this number has since increased to something not far short of three hundred. The hospital at Cranleigh is strictly a cottage, of a characteristic Surrey type, and its essentially cottage character is justly regarded by its founder as a valuable testimony to the success of his system. The building is partly of brick, partly of timber framing covered with tiles, and inside, the old brick chimney breast, the brick paving, and the corkscrew staircase, with a rope for handrail, all remain to show how little modification the cottage has undergone to fit it for its new duties.

Of the many cottage hospitals which have been erected during the last few years, several fulfil well the conditions necessary to the successful treatment of disease; while many others, unfortunately, repeat only too literally the sanitary mistakes so fatally prevalent in buildings of a larger kind.

In this brief survey of the progress of hospital building in recent years, many points of detail have of necessity been passed over; such, for example, as baths for therapeutic purposes; appliances which, while they are to be found in almost every new and in many of the older hospitals abroad, can scarcely be said to exist in England. It must be admitted that the cause in great measure of the mistakes that are made is the want of *rapport* that exists between the medical and the lay element in hospital administrators. In planning a new hospital, or in improving an old one, an essential element of success is a cordial coöperation between committee, medical staff, and architect; and, unless these three authorities work together, and not, as is too often the case, the committee scheme, and their architect plans, without reference to the medical staff, failure is inevitable.

ABSCESS OF THE PANCREAS AND THROMBOSIS OF THE PORTAL VEIN.

By J. H. Musser, M.D.,
ATTENDING PHYSICIAN TO THE PHILADELPHIA HOSPITAL, AND CHIEF OF THE MEDICAL DISPENSARY OF THE HOSPITAL OF THE UNIVERSITY OF PENNSYLVANIA.

Abscess of the pancreas is of such rare occurrence that any opportunity to study its pathology should be taken advantage of and the facts, be they ever so meagre, brought to the notice of the profession. It is hoped that this consideration is sufficient apology for the following detail:

Case. *Abscess of the Pancreas, communicating with the Duodeno-jejunal Fossa; Thrombosis of the Portal Vein; Ascites, rapidly recurring after Tapping; Tumor; Emaciation; Marked Absence of other Symptoms of Grave Disease; Death; Autopsy.*—W. B., male, aged forty-two, born in England, single, shoemaker, was admitted to the wards of the Presbyterian Hospital, May 12, 1885, and died June 6th following. He was under the care of Dr. Patterson.

Nothing could be learned of his family history. His antecedent history, regarding health, was good, regarding personal habits, very bad. He was addicted to intemperance, and was known as a "dead beat." For years he had been an outcast; was exposed to all kinds of weather,